

5       What is claimed is:

1.       An imaging system comprising:
  - (a)       an imaging device sensing an object having a first background color;
  - (b)       a backing in opposing relationship with said object having a second background color substantially the same as said first background color; and
  - (c)       said imaging system determines at least one general bounding region of said object based upon a shadow cast onto said backing by said object.
2.       The imaging system of claim 1 wherein said object is a substantially flat document.
3.       The imaging system of claim 2 wherein said backing is a cover and is substantially flat and is in face-to-face relationship with said object.
4.       The imaging system of claim 3 wherein said second background color covers a major portion of said cover.

5. The imaging system of claim 4 wherein said imaging system determines a plurality of boundaries of said object.

6. The imaging system of claim 5 wherein said imaging system determines four boundaries of said object.

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7. The imaging system of claim 5 wherein said imaging device has a flat surface supporting said object.

8. The imaging system of claim 7 wherein said object is paper.

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5                   12. The imaging system of claim 1 wherein said imaging system increases the  
differences of values in the range of likely document edge values.

10                  13. The imaging system of claim 12 wherein said imaging system converts a  
first color space of an image obtained from sensing said object to a second  
color space where the luminance of said image is enhanced over the first  
color space when determining said at least one boundary of said object.

15                  14. The imaging system of claim 1 wherein an image obtained from sensing  
said object has a plurality of horizontal rows of pixels, said imaging  
system dividing said horizontal rows of pixels in a plurality of groups,  
each of said groups including a plurality of said horizontal rows of pixels,  
computing a statistical measure in a direction transverse to said horizontal  
row of pixels, using said statistical measure in determining said at least  
one boundary of said object.

20                  15. The imaging system of claim 1 wherein an image obtained from sensing  
said object has a plurality of vertical columns of pixels, said imaging  
system dividing said vertical columns of pixels in a plurality of groups,  
each of said groups including a plurality of said vertical columns of pixels,  
computing a statistical measure in a direction transverse to said vertical

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5 column of pixels, using said statistical measure in determining said at least one boundary of said object.

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16. The imaging system of claim 14 wherein an image obtained from sensing said object has a plurality of vertical columns of pixels, said imaging system dividing said vertical columns of pixels in a plurality of groups, each of said groups including a plurality of said vertical columns of pixels, computing a statistical measure in a direction transverse to said vertical column of pixels, using said statistical measure in determining said at least one boundary of said object.
17. The imaging system of claim 14 further comprising determining edges within the data determined as a result of computing said statistical measure.
18. The imaging system of claim 15 further comprising determining edges within the data determined as a result of computing said statistical measure.
19. The imaging system of claim 16 further comprising determining edges within the data determined as a result of computing said statistical measures.

5           20. The imaging system of claim 17 wherein a set of statistical measures in a direction transverse to said horizontal row of pixels from a plurality of said groups are statistically processed for determining said at least one boundary of said object.

10           21. The imaging system of claim 18 wherein a set of statistical measures in a direction transverse to said vertical column of pixels from a plurality of said groups are statistically processed for determining said at least one boundary of said object.

15           22. The imaging system of claim 20 wherein the result of processing said set of statistical measures are further processed to emphasize spatial regions of increased statistical measure.

20           23. The imaging system of claim 21 wherein the result of processing said set of statistical measures are further processed to emphasize spatial regions of increased statistical measure.

25           24. The imaging system of claim 20 wherein said determining said at least one boundary of said object is based upon a variable threshold value calculated based upon said set of statistical measures.

5            25. The imaging system of claim 21 wherein said determining said at least one boundary of said object is based upon a variable threshold value calculated based upon said set of statistical measures.

10            26. The imaging system of claim 24 wherein said variable threshold value is calculated based upon a percentage of the maximum observed statistical measure.

15            27. The imaging system of claim 25 wherein said variable threshold value is calculated based upon a percentage of the maximum observed statistical measure.

20            28. An imaging system comprising:  
                  (a) an imaging device sensing an object;  
                  (b) a backing in opposing relationship with said object; and  
                  (c) said imaging system determines at least one general bounding region of said object.

25            29. The imaging system of claim 28 wherein said imaging system converts a first color space of an image obtained from sensing said object to a second color space where the luminance of said image is enhanced over the first color space for determining said at least one boundary of said object.

5           30. The imaging system of claim 29 wherein said first color space includes a plurality of dimensions and said second color space includes fewer dimensions than said first color space.

10           31. The imaging system of claim 30 wherein said first color space is red, green, and blue, and said second color space is luminance.

15           32. The imaging system of claim 28 wherein said imaging system increases the differences of values in the range of likely document edge values.

20           33. The imaging system of claim 32 wherein said imaging system converts a first color space of an image obtained from sensing said object to a second color space where the luminance of said image is enhanced over the first color space when determining said at least one boundary of said object.

25           34. The imaging system of claim 28 wherein an image obtained from sensing said object has a plurality of horizontal rows of pixels, said imaging system dividing said horizontal rows of pixels in a plurality of groups, each of said groups including a plurality of said horizontal rows of pixels, computing a statistical measure in a direction transverse to said horizontal row of pixels, using said statistical measure in determining said at least one boundary of said object.

5           35. The imaging system of claim 28 wherein an image obtained from sensing  
said object has a plurality of vertical columns of pixels, said imaging  
system dividing said vertical columns of pixels in a plurality of groups,  
each of said groups including a plurality of said vertical columns of pixels,  
computing a statistical measure in a direction transverse to said vertical  
column of pixels, using said statistical measure in determining said at least  
one boundary of said object.

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15           36. The imaging system of claim 34 wherein an image obtained from sensing  
said object has a plurality of vertical columns of pixels, said imaging  
system dividing said vertical columns of pixels in a plurality of groups,  
each of said groups including a plurality of said vertical columns of pixels,  
computing a statistical measure in a direction transverse to said vertical  
column of pixels, using said statistical measure in determining said at least  
one boundary of said object.

20           37. The imaging system of claim 34 further comprising determining edges  
within the data determined as a result of computing said statistical  
measure.

5           38. The imaging system of claim 35 further comprising determining edges  
                  within the data determined as a result of computing said statistical  
                  measure.

10           39. The imaging system of claim 36 further comprising determining edges  
                  within the data determined as a result of computing said statistical  
                  measures.

15           40. The imaging system of claim 37 wherein a set of statistical measures in a  
                  direction transverse to said horizontal row of pixels from a plurality of said  
                  groups are statistically processed for determining said at least one  
                  boundary of said object.

20           41. The imaging system of claim 38 wherein a set of statistical measures in a  
                  direction transverse to said vertical column of pixels from a plurality of  
                  said groups are statistically processed for determining said at least one  
                  boundary of said object.

25           42. The imaging system of claim 40 wherein the result of processing said set  
                  of statistical measures are further processed to emphasize spatial regions  
                  of increased statistical measure.

5                   43. The imaging system of claim 41 wherein the result of processing said set of statistical measures are further processed to emphasize spatial regions of increased statistical measure.

10                  44. The imaging system of claim 40 wherein said determining said at least one boundary of said object is based upon a variable threshold value calculated based upon said set of statistical measures.

15                  45. The imaging system of claim 41 wherein said determining said at least one boundary of said object is based upon a variable threshold value calculated based upon said set of statistical measures.

20                  46. The imaging system of claim 44 wherein said variable threshold value is calculated based upon a percentage of the maximum observed statistical measure.

47. The imaging system of claim 45 wherein said variable threshold value is calculated based upon a percentage of the maximum observed statistical measure.